

ABSTRACT

5 An electric field that changes across space is  
synthesized, by applying voltage levels independent of one  
another at several locations. The independence in voltage  
10 levels allows the electric field that is synthesized to be  
made periodic or aperiodic. Such a synthesized electric  
field may be changed at any time for use in, for example, a  
tunable laser. In one embodiment, the voltage levels are  
oversampled, although in other embodiments the voltage  
15 levels need not be oversampled, e.g. if the to-be-  
synthesized electric field is aperiodic. Also, in one  
embodiment, the electric field is used to change the  
refractive index of an electro-optic substance (such as  
lithium niobate) in an optical filter. Such an optical  
20 filter can be used as part of a wavelength agile laser or in  
an optical add drop multiplexer or in an optical switch.  
Such a filter can also be used for dynamic power balancing  
and/or for dynamic gain equalization.